

Matched N-Channel Pairs

| PRODUCT SUMMARY | | | | | |
|------------------------|-------------------|-----------------------|-------------------|----------------|--------------------------------|
| Part Number | $V_{GS(off)}$ (V) | $V_{(BR)GSS}$ Min (V) | g_{fs} Min (mS) | I_G Typ (pA) | $ V_{GS1} - V_{GS2} $ Typ (mV) |
| U430 | -1 to -4 | -25 | 10 | -15 | 25 |
| U431 | -2 to -6 | -25 | 10 | -15 | 25 |

FEATURES

- Two-Chip Design
- High Slew Rate
- Low Offset/Drift Voltage
- Low Gate Leakage: 15 pA
- Low Noise
- High CMRR: 75 dB

BENEFITS

- Tight Differential Match vs. Current
- Improved Op Amp Speed, Settling Time Accuracy
- Minimum Input Error/Trimming Requirement
- Insignificant Signal Loss/Error Voltage
- High System Sensitivity
- Minimum Error with Large Input Signals

APPLICATIONS

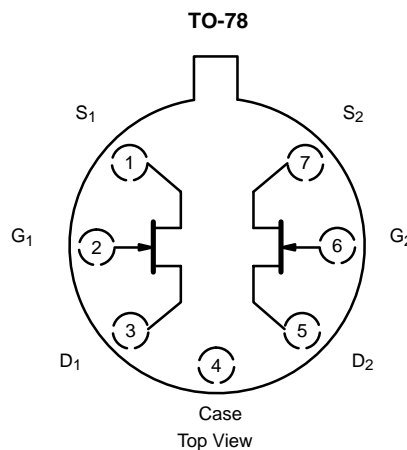
- Wideband Differential Amps
- High-Speed, Temp-Compensated, Single-Ended Input Amps
- High-Speed Comparators
- Impedance Converters

DESCRIPTION

The U430/431 are matched JFET pairs assembled in a TO-78 package. These devices offer good power gain even at frequencies beyond 250 MHz.

The TO-78 package is available with full military processing (see Military Information).

For similar products, see the low-noise U/SST401 series, the high-gain 2N5911/5912, and the low-leakage U421/423 data sheets.



ABSOLUTE MAXIMUM RATINGS

| | |
|----------------------------------------------------|---------------|
| Gate-Drain, Gate-Source Voltage | -25 V |
| Gate Current | 10 mA |
| Lead Temperature ($1/16$ " from case for 10 sec.) | 300 °C |
| Storage Temperature | -65 to 200 °C |
| Operating Junction Temperature | -55 to 150 °C |

| | | |
|---------------------|-----------------------|--------|
| Power Dissipation : | Per Side ^a | 300 mW |
| | Total ^b | 500 mW |

- Notes
- a. Derate 2.4 mW/°C above 25 °C
 - b. Derate 4 mW/°C above 25 °C

| SPECIFICATIONS (T _A = 25 °C UNLESS OTHERWISE NOTED) | | | | | | | | |
|----------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------|-------------------------|--------|------|------|------|------------|
| Parameter | Symbol | Test Conditions | Typ ^b | Limits | | | | Unit |
| | | | | U430 | | U431 | | |
| | | | | Min | Max | Min | Max | |
| Static | | | | | | | | |
| Gate-Source Breakdown Voltage | V _{(BR)GSS} | I _G = -1 μA, V _{DS} = 0 V | -35 | -25 | | -25 | | V |
| Gate-Source Cutoff Voltage | V _{GS(off)} | V _{DS} = 10 V, I _D = 1 nA | | -1 | -4 | -2 | -6 | |
| Saturation Drain Current ^b | I _{DSS} | V _{DS} = 10 V, V _{GS} = 0 V | | 12 | 30 | 24 | 60 | mA |
| Gate Reverse Current | I _{GSS} | V _{GS} = -15 V, V _{DS} = 0 V | | | -150 | | -150 | pA |
| | | | T _A = 150 °C | -10 | | | -150 | nA |
| Gate Operating Current | I _G | V _{DG} = 10 V, I _D = 5 mA | | | | | | pA |
| | | | T _A = 150 °C | -10 | | | | nA |
| Gate-Source Forward Voltage | V _{GS(F)} | I _G = 10 mA, V _{DS} = 0 V | 0.8 | | 1 | | 1 | V |
| Dynamic | | | | | | | | |
| Common-Source Forward Transconductance ^b | g _{fs} | V _{DS} = 10 V, I _D = 10 mA, f = 1 kHz | 15 | 10 | | 10 | | mS |
| Common-Source Output Conductance ^b | g _{os} | | 100 | | 250 | | 250 | μS |
| Common-Source Input Capacitance | C _{iss} | V _{GS} = -10 V, V _{DS} = 0 V, f = 1 MHz | 4.5 | | 5 | | 5 | pF |
| Common-Source Reverse Transfer Capacitance | C _{rss} | | 2 | | 2.5 | | 2.5 | |
| Equivalent Input Noise Voltage | \bar{e}_n | V _{DS} = 10 V, I _D = 10 mA f = 100 Hz | 6 | | | | | nV/ √Hz |
| High Frequency | | | | | | | | |
| Common-Source Forward Transconductance | g _{fs} | V _{DS} = 10 V, I _D = 10 mA f = 100 MHz | 14 | | | | | mS |
| Common-Source Output Conductance | g _{os} | | 0.13 | | | | | |
| Power-Match Source Admittance | g _{ig} | | 12 | | | | | |
| Matching | | | | | | | | |
| Differential Gate-Source Voltage | V _{GS1} - V _{GS2} | V _{DG} = 10 V, I _D = 10 mA | 25 | | | | | mV |
| Saturation Drain Current Ratio ^c | $\frac{I_{DSS1}}{I_{DSS2}}$ | V _{DS} = 10 V, V _{GS} = 0 V | 0.95 | 0.9 | 1 | 0.9 | 1 | |
| Transconductance Ratio ^c | $\frac{g_{fs1}}{g_{fs2}}$ | V _{DS} = 10 V, I _D = 10 mA, f = 1 kHz | 0.95 | 0.9 | 1 | 0.9 | 1 | |
| Gate-Source Cutoff Voltage Ratio ^c | $\frac{V_{GS(off)1}}{V_{GS(off)2}}$ | V _{DS} = 10 V, I _D = 1 nA | 0.95 | 0.9 | 1 | 0.9 | 1 | |
| Differential Gate Current | I _{G1} - I _{G2} | V _{DG} = 10 V, I _D = 5 mA | -2 | | | | | pA |
| Common Mode Rejection Ratio | CMRR | V _{DG} = 5 to 10 V, I _D = 10 mA | 75 | | | | | dB |

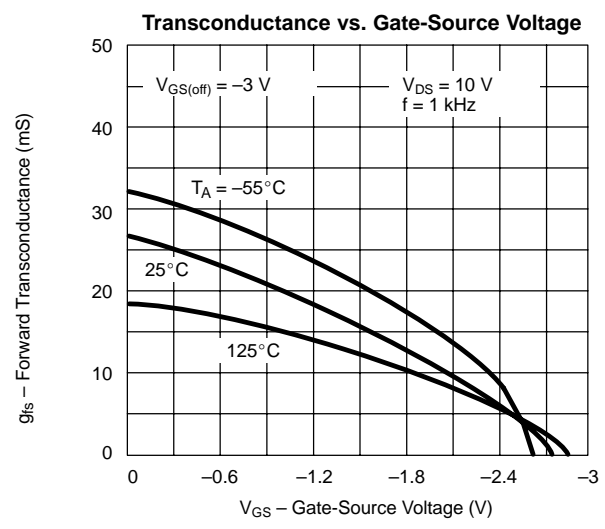
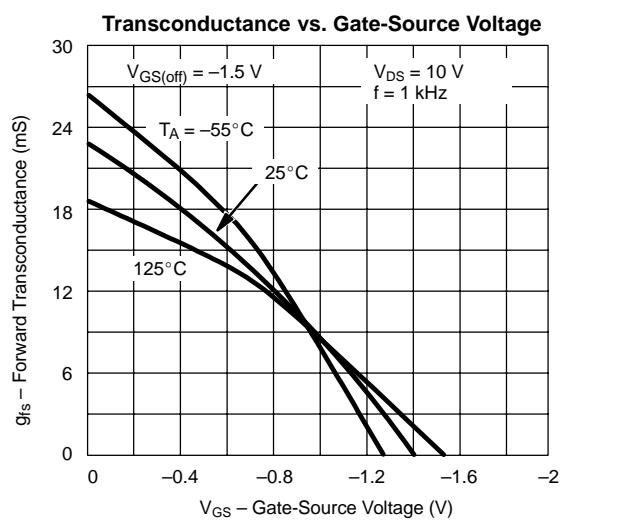
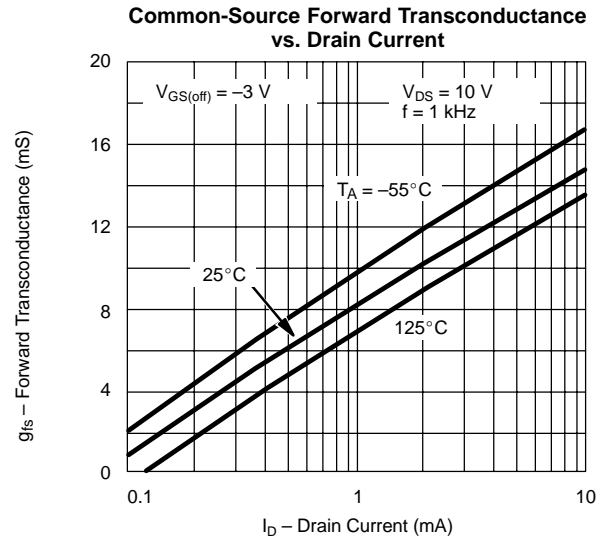
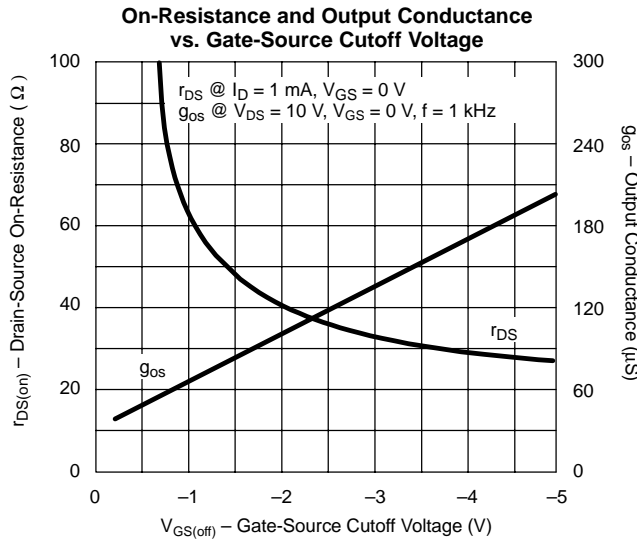
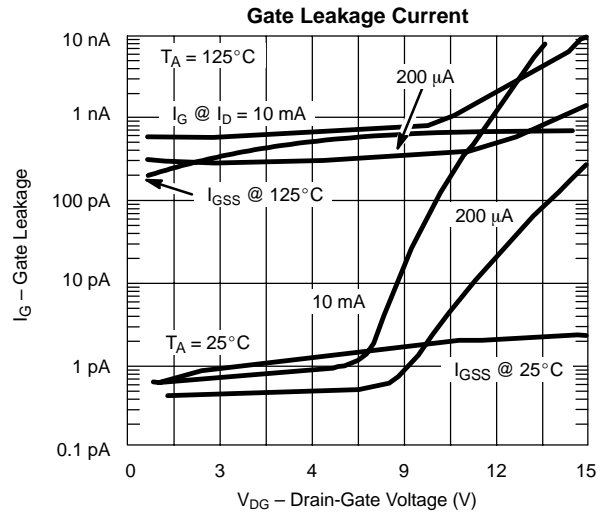
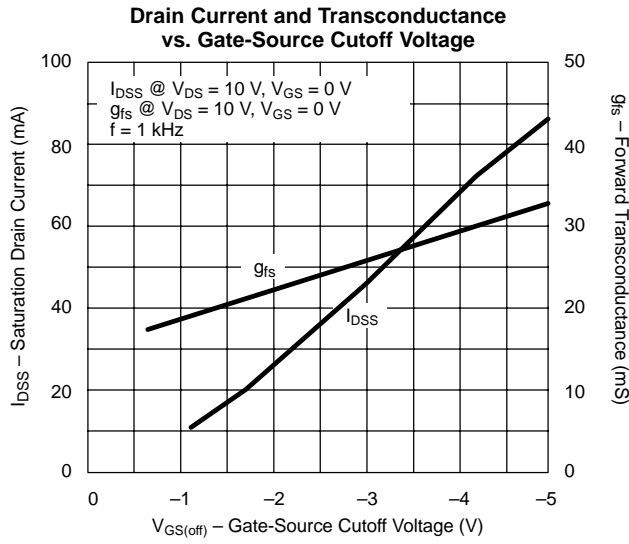
Notes

- Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
- Pulse test: PW ≤ 300 μs duty cycle ≤ 3%.
- Assumes smaller value in the numerator.

NZBD

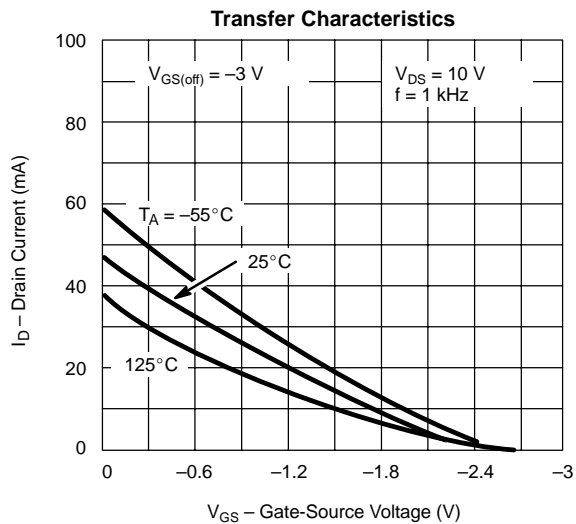
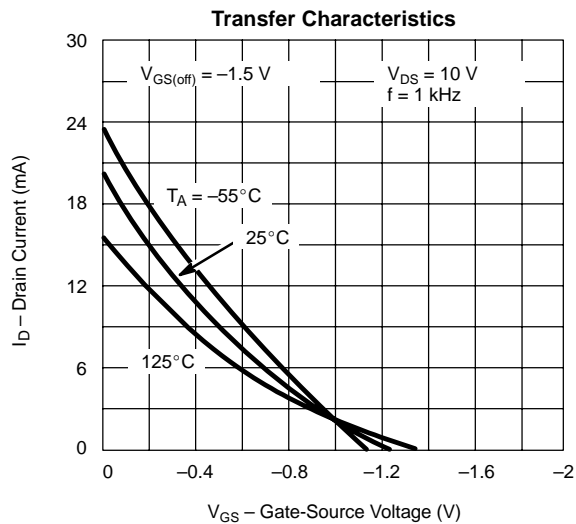
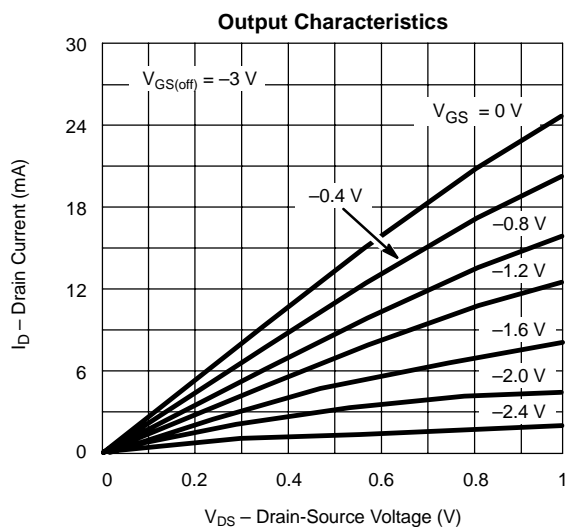
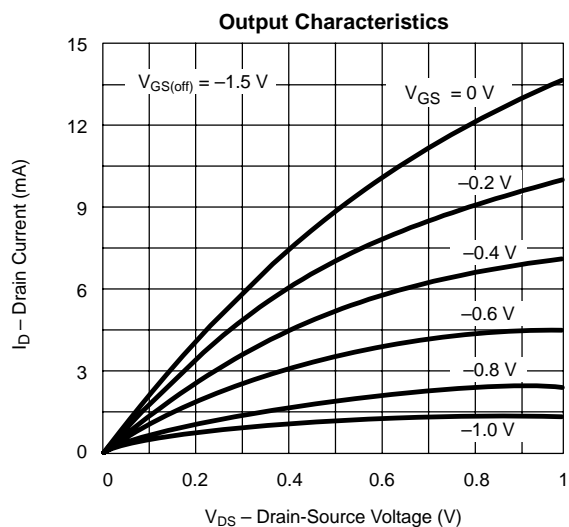
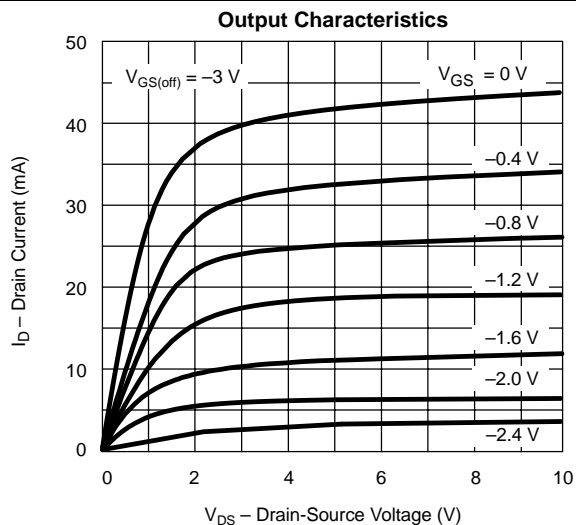
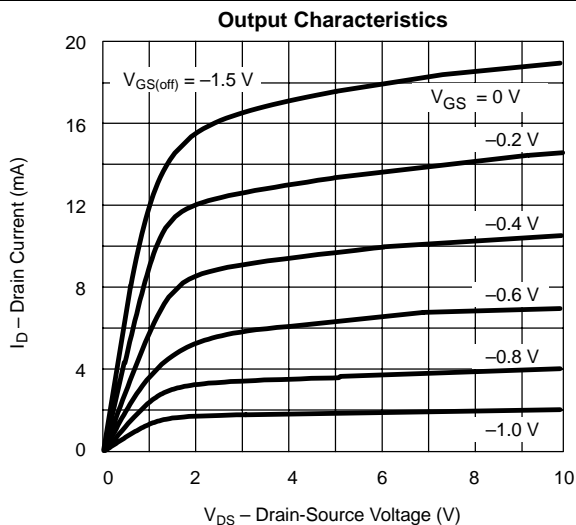


TYPICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)



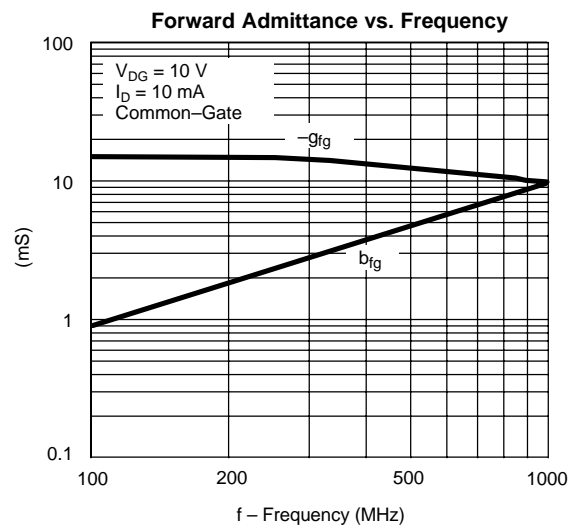
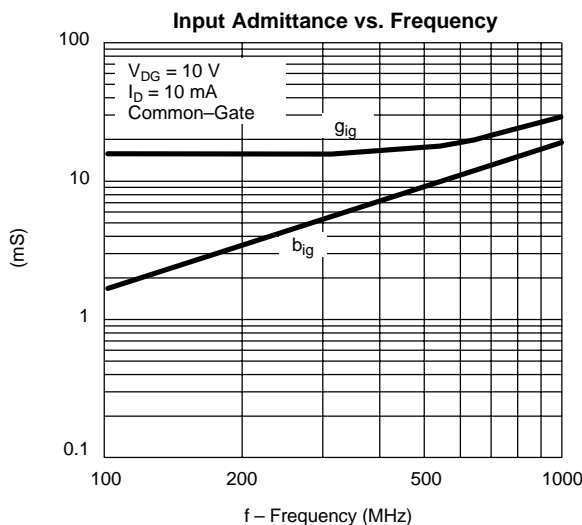
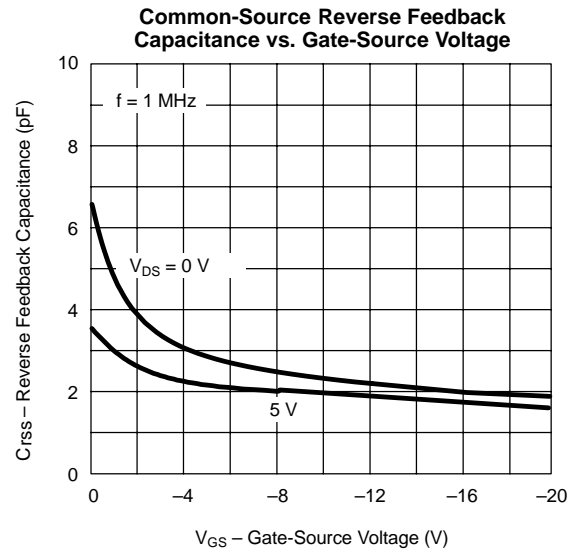
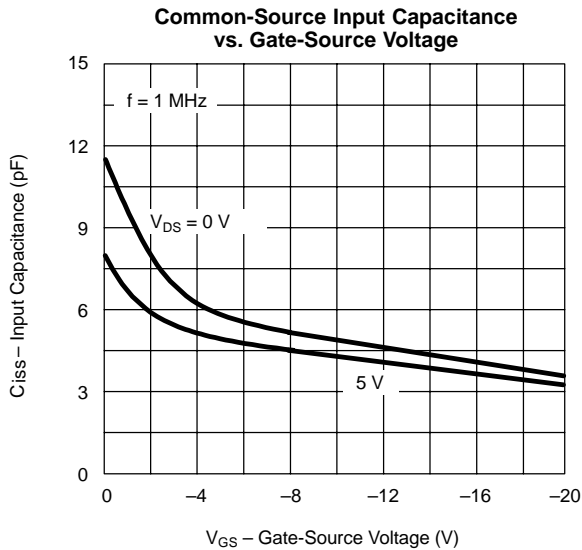
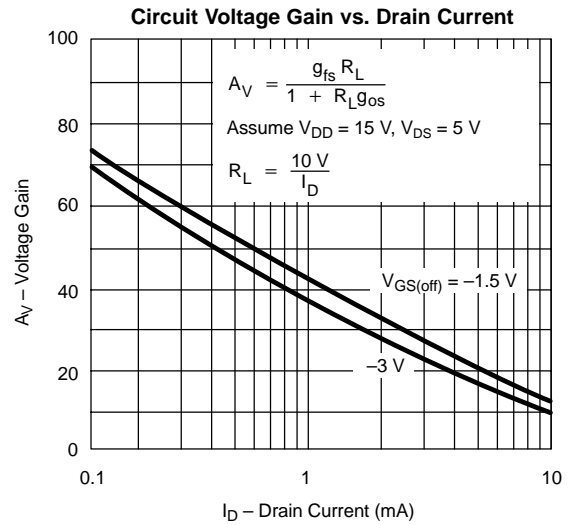
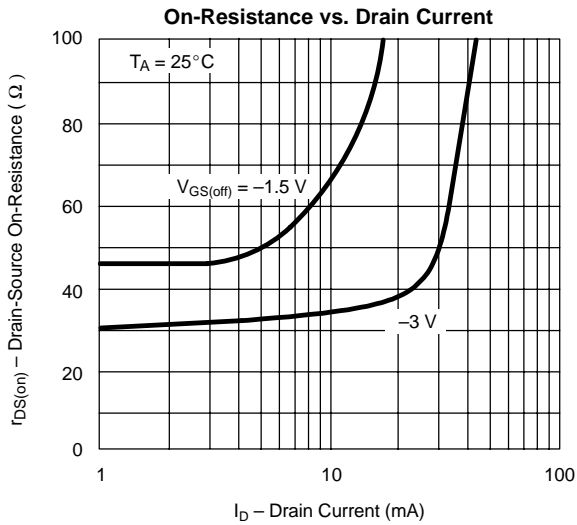


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